

TWO NEW SPECIES OF ALOE (LILIACEAE) FROM TROPICAL AFRICA

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ABSTRACT

Two new species of *Aloe* (*Liliaceae*) are described, their apparent relationships discussed and their positions in the "Key to the species" in Reynolds, *The Aloes of Tropical Africa and Madagascar* (1966), are indicated.

UITTREKSEL

TWEE NUWE ALOE-SOORTE (LILIACEAE) VAN TROPIESE AFRIKA. Twee nuwe *Aloe-soorte* (*Liliaceae*) word beskryf, hulle blykbare verwantskap bespreek en hul plek in die „Sleutel tot die soorte" in Reynolds, *The Aloes of Tropical Africa and Madagascar* (1966) word aangedui.

Aloe cannellii Leach, sp. nov.

A. wildii (Reynolds) Reynolds affinis sed planta parviore magis caespitosa; foliis angustioribus rosulatis, marginibus cartilagineis angustis hyalinis (in sicco albescentibus), dentibus parvioribus confertioribus; floribus brevioribus minus ventricosis; capsulis parvioribus differt.

Planta caespitosa, habitu patulo vel pendentis, surculis quaquaversus effusus ex caulorhiza substuberosa exilientibus; radices carnosae subfusiformes. *Folia* plerumque 4–5, rosulata, ad 26 cm longa, 4–8 mm lata, linearia, basaliter dilato-amplexicaulia, in apicem acutum gradatim angustata, patula vel flaccida, e brunneo viridia; marginibus angustis cartilagineis hyalinis (in sicco albescentibus), dentibus acutis minutis, c. 0·25 mm longis, plerumque c. 1 mm distantibus. *Inflorescentia* simplex, 20–30 cm alta, erecta vel ascendentis-erecta. *Pedunculus* gracilis, teres (infra interdum leviter compressus), c. 3 mm diam., viridis; bracteis sterilibus 5–6, quam bracteis floralibus multo grandioribus. *Racemus* floribus 14–15 (10–20) laxe dispositis, c. 10 cm longus (12·5); gemmis initio suberectis mox patentissimis, atrocarmineis ad apicem caesio-viridibus mox viridescentibus; floribus apertis subpendulis, coccineo-aurantiacis ad apicem viridibus. *Bractee* scariosae, exalbidae, ovato-acutae, 4·5–6·5 mm longae, 3–3·5 mm latae; nervis 3, obscuris, confluentibus, rubro-brunneis. *Pedicelli* 10–13 mm longi, perianthio basi stipitatae articulati. *Perianthium* coccineo-aurantiacum ad orem viridescens, cylindraceo-trigonum, basaliter subobconicum breviter stipitatum, supra medium subventricosum, 20–22 (25) mm longum, prope basin c. 3·5–4 mm diam., inde ad c. 5 mm amplificatum, tum ad c. 4 mm prope orem patulum constrictum; *segmenta exteriora* basi libera.

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nervis obscuris 3, ad apicem confluentibus viridibus; *segmenta interiora* quam exteriora latiora et obtusiora, marginibus tenuis exalbidis translucidis, nervis obscuris 3, perleviter auriantico-carinata, ad spicem viridula. *Antherae* inclusae. *Stigma* demum vix vel haud exsertum. *Ovarium* viridulum vel lutescens, c. 4·5 mm longum, 1·75—2 mm diam. *Capsula* (sicca) bubalina, longitudinaliter caperata, 11·5 mm longa, c. 4·5 mm diam.; lobis non valde patulis, medio valde sulcatis. *Semina* atro-brunnea, parce minute pusticulato-tuberculata, superficiebus imparibus perleviter convexis 4—5, angulis parum alatis, c. 3·5 mm longa.

Type: Moçambique, Manica e Sofala Distr., *I. C. Cannell* 33 (LISC; PRE; SRGH, holo.).

Moçambique. **MS:** Manica e Sofala Distr., cult. Bulawayo, Rhodesia, fl. Aug. 1968, *I. C. Cannell* 33 (LISC; PRE; SRGH), idem Hort. *Bullock*, Bulawayo, fl. March 1967 (LMA), ibid. cult. Greendale, fl. 25.iv.1970, *Leach & Cannell* 14407 (K).



FIG. 1.
Cultivated plant flowering at Bulawayo, Aug. 1968.
I. C. Cannell 33.

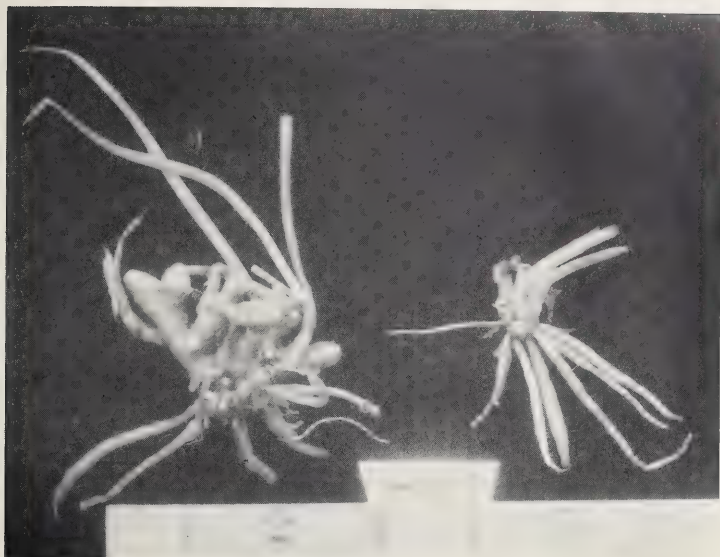


FIG. 2.
Subtuberous rootstock with fleshy subfusiform roots.
Leach and Cannell 14407.
Aloe cannellii Leach.

The flowering period of this species appears to be very variable; plants in cultivation flower almost continuously if watered (cf. *A. ballii* Reynolds).

A. cannellii appears to be most closely related to *A. wildii* which is endemic to the Chimanimani Mountains, and with which it possibly forms a vicariant pair. The new species differs from this its nearest relative in being a smaller, more tufted plant with narrower rosulate leaves with narrow hyaline cartilaginous margins and smaller more closely set teeth; the smaller flowers are less markedly ventricose and the darker coloured seeds are contained in a much smaller capsule. In leaf characters only, the new species is possibly nearer to *A. torrei* Christian et Verdoorn but differs therefrom in many other ways.

The seeds of *A. inyangensis* Christian, *A. howmanii* Reynolds, *A. hazeliana* Reynolds, *A. musapana* Reynolds, *A. wildii* and *A. cannellii* are all somewhat similar as to size and shape, but are distinguishable from each other by their colour, which appears, from the admittedly limited material available, to be constant for a given species.

A. cannellii is named in honour of Mr. Ian Cannell who, in the course of numerous botanising excursions in the Flora Zambesiaca area, has made several interesting discoveries, including the attractive new species now described. Plants were found not far from the summit of an isolated mountain in the Manica e Sofala District of Moçambique; the exact locality is not herein disclosed as it is feared that consequent depredations by "collectors" might eliminate the species from its natural habitat, which is, as far as is known, restricted to one relatively small area.

Plants are not very plentiful and appear to occur only on south-east facing, almost vertical cliffs, at an altitude of $\pm$ 1500 m. Embedded in peat-like masses of grass tufts and roots, plants are by no means conspicuous and but for an out of season inflorescence would possibly have remained undiscovered. Although the flowering of this solitary specimen was almost over it was recognised by Mr. Cannell as being different from any of the related species known to him and after some diligent searching, further rather dried up plants were found. Two or three of these were collected and placed in cultivation at Bulawayo, where they subsequently flowered, enabling photographs to be taken, material prepared and a description drawn up.

This addition to Berger's Section *Leptoaloe* would fit into Reynolds's key in "Aloes of Tropical Africa and Madagascar: 11 (1966)" under Group 3 "Leaves always rosulate": "B Plants acaulescent or almost so" and is distinguished from the others in the group by its much shorter (10—15 mm) pedicels and shorter (20—25 mm) perianth.

Plant tufted, with shoots spreading in all directions, arising from a partially exposed subtuberous rootstock with fleshy subfusiform roots; plants forming clumps with a spreading or pendent habit. *Leaves* green or with a brownish tinge, rosulate, usually 4—5, up to 26 cm long, 4—8 mm wide, linear, basally dilated-amplexicaul, gradually tapering into the acute apex, spreading to flaccidly decurved, with a narrow hyaline (drying whitish) cartilaginous margin armed with minute, translucent, whitish, acute teeth about 0.25 mm long and rather variably spaced, generally $\pm$ 1 mm apart (occasionally a leaf may be found in which both margin and teeth are partially absent); *upper surface* more or less flat below, shallowly canaliculate above, sometimes with a few scattered whitish spots in the lower portion, *lower surface* convex, more copiously white spotted from about half way, the spots becoming more crowded towards the base. *Inflorescence* simple, 20—30 cm tall, erect or ascending-erect. *Peduncle* slender, terete (sometimes slightly compressed below), c. 3 mm diam., green, devoid of bloom, with 5—6 sterile bracts which are much larger than the floral bracts. *Raceme* laxly 14—15 flowered (10—20), about 10 cm long (12.5); buds at first suberect soon becoming widely spreading, dark carmine blue-green tipped,

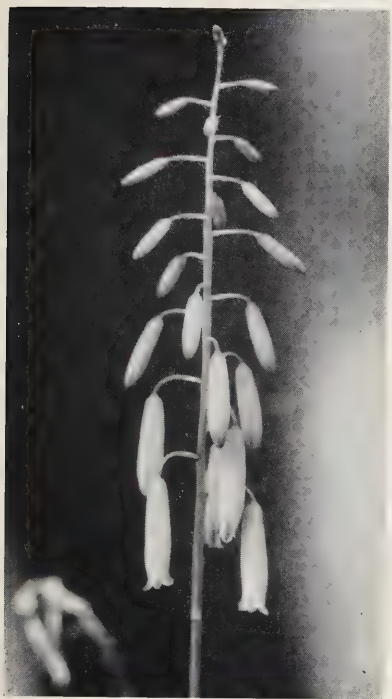


FIG. 3.

An exceptionally long raceme, shewing flowers with the perianth sharply constricted just below the widely open mouth.

Clone of *Cannell* 33 cult. Salisbury,

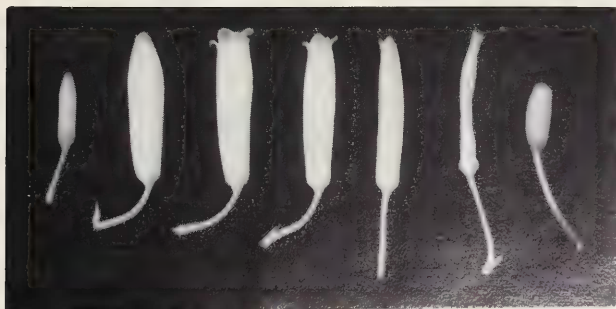
N. D. Bey.

Photo by courtesy of Mr. N. D. Bey.

FIG. 4.

Flowers 1/1, bud to young capsule from the above raceme *Aloe cannellii* Leach.

Photo L. C. Leach.



soon becoming paler with greenish tip; open flowers subpendulous, red-orange, green tipped. *Bracts* scarious, whitish with 3 indistinct, confluent red-brown nerves, ovate acute, 4.5–6.5 mm long, 3–3.5 mm wide. *Pedicels* 10–13 (15) mm long, articulated to the stipitate base of the perianth. *Perianth* orange-scarlet grading into orange towards the greenish mouth, cylindric trigonous, basally subobconic, shortly stipitate, slightly ventricose above the middle, 20–22 (25) mm long, about 3.5–4 mm diam. towards the base, enlarging to ± 5 mm, then again slightly, although somewhat sharply, constricted to about 4 mm diam. immediately below the widely spreading apices of the segments; *outer segments* free to the base, orange-scarlet to orange with three obscure nerves becoming bright green at their confluent apex; *inner segments* free, wider and more obtuse than the outer, with thin, translucent, whitish margins and three obscure nerves forming a slight keel, orange towards the base becoming bright green at the apex. *Filaments* pale translucent green to white, the three inner lengthening before the outer; *anthers* not exerted, red-orange with peach coloured pollen; *style* whitish at the base becoming pale yellowish green towards the translucent whitish stigma, which is not or scarcely exerted. *Ovary* 6-grooved, yellow-green to orange-yellow, c. 4.5 mm long, 1.75–2 mm diam. *Capsule* (dry) brownish buff, longitudinally wrinkled, 11.5 mm long, ± 4.5 mm diam.; lobes not widely spreading, each with a deep median furrow. *Seeds* dark brown, sparingly minutely pustulate-tuberculate, with 4–5 unequal, slightly convex faces, winged on the angles but not very prominently so, ± 3.5 mm long $\times$ 1.25 mm diam.

***Aloe trigonantha* Leach, sp. nov.**

A. crassipedi Bak. affinis sed plantis surculis basilaribus aggregatis; foliorum dentibus parvioribus; racemis laxioribus floriferis, floribus scarlatinis, segmentis ad apicem minutissime denticulatis; bracteis parvioribus attenuatioribus, prominenter medinerviis saepe uninerviis, margine minutissime denticulato distinguenda.

Plantae acaulescentes, e basi surculis aggregatis. *Folia* c. 24, dense rosulata, valde patentia, 30–45 cm longa, basi 5–10 cm lata, apicem versus leviter recurva vel aliquantum flaccida, plerumque parte apicali siccata marcidaque; *supra* pallide viridia sparsim albo-maculata, spicem versus roseo-brunnescentia, basi leviter concava, superne aliquantum canaliculata; *subtus* convexa, pallide caesio-viridia modice albo-maculata; *margines* dentibus pungentibus deltatis vel interdum uncinatis, ± 3 mm longis, 1–2 cm distantibus armati. *Inflorescentia* paniculata, infra medium ramosa, 60–90 cm alta. *Pedunculus* viridis (in sicco brunneus), basi plano-convexus, usque ad 2 cm latus. *Racemi* laxe floriferi, cylindraco-acuminati, c. 20 cm longi, 7 cm diam., gemmis patulis et floribus apertis cernuis. *Bractee* deltato-attenuatae vel ovato-acuminatae, scariosae,

brunneo-albae, 5–10 mm longae, 3–5 mm latae, prominenter medinerves saepe uninerves, marginibus minutissime denticulatis. *Pedicelli* patuli, usque ad 15 mm longi. *Perianthium* scarlatinum, crassum carnosumque, breviter stipitatum, 35 mm longum, ad basim subtruncatum 10–12 mm diam. inde gradatim decrescens, sigillatim trigonum, 7–8 mm diam. leviter lateraliter compressum, ad orem apertura triangulari 3–4 mm lata; *segmenta* ad apicem acuta, minutissime denticulata; *exteriora* per 10 mm libera, obscure triplinervia; *interiora* latiora, carinata, apice patulo-recurva. *Antherae* inclusae vel perbre-viter exsertae. *Ovarium* viride, 6.5 mm longum, c. 3 mm diam. *Stylus* demum vix vel usque ad 1 mm exsertus. *Semina* atro-brunnea, tenui-alata, irregulariter et variabiliter triquetra, 5.5–7 mm longa, c. 3 mm lata.

Type: N. Ethiopia, Begemdir Province, *MacLeay* in *Reynolds* 11618 (PRE, holo.; SRGH).

Ethiopia: Begemdir Prov., between Gondar and Lake Tana, alt. $\pm$ 2500 m, cult. Mbabane, Swaziland, fl. 15.viii.1965, *MacLeay* in *Reynolds* 11618 (PRE, holo.; SRGH), idem Hort. A. J. Jones, White River, Transvaal, fl. 27.vii.1966, (BR; MO), idem Hort. *Leach*, Nelspruit, Transvaal, fl. 9.vii.1967 (EA; K).

Aloe trigonantha was discovered by Professor K.N.G. MacLeay, at that time of the Department of Botany, University College of Khartoum, who found plants "common in grass near the roadside, between Gondar and Lake Tana, at an altitude of approximately 2500 m." Lake Tana lies athwart the boundary between the Begemdir and Gojjam Provinces of N. Ethiopia at an altitude of 1830 m, at approximately 12° 00' N: 37° 30' E.

Live plants sent to the late Dr. Reynolds flowered in cultivation at Mbabane, Swaziland, for the first time on 15th August 1965 at a time when Dr. Reynolds's health was beginning to fail and the manuscript for his second exhaustive monograph was demanding all his energies. Despite this preoccupation however, photographs were taken, herbarium material prepared and a partial description drawn up. Plants of clonal origin subsequently flowered in Dr. A. J. Jones's garden at White River, Transvaal and in the author's garden at Nelspruit, when further specimens were obtained, enabling the description eventually to be completed and relationships assessed.

The new species appears to be most closely related to *A. crassipes* Bak. but differs in forming groups from basal shoots, in having more widely spreading more softly textured, less fiercely armed leaves (which are even closer to those of *A. christianii* Reynolds than are those of *A. crassipes*), and laxly flowered racemes of scarlet flowers with the acute apices of their perianth segments minutely denticulate; the smaller, more attenuate, plicate-keeled bracts with minutely denticulate margins and a prominent, often solitary median nerve are



FIG. 5.

Cultivated plant flowering at Mbabane, Swaziland. Height 90 cm. *Reynolds* 11618.

Aloe trigonantha Leach.

Photo by courtesy of the late Dr. G. W. Reynolds.

also quite different from those of *A. crassipes* which are somewhat fleshy, not at all keeled, and have $4-5 \pm$ equal, not at all prominent nerves and entire margins.

There appears also to be an affinity with *A. percrassa* Tod. and particularly with *A. steudneri* Schweinf., which both occur in the same general geographical region and appear to occupy somewhat similar montane habitats. However,

A. trigonantha differs in several respects from both of these in having widely spreading leaves, a more freely branched panicle of more laxly flowered racemes, perianth segment apices minutely denticulate, and bracts with a prominent often solitary median nerve and minutely denticulate margins. From the former the new species is also immediately distinguished by its much larger fleshy flowers, and from the latter in having smaller flowers with segments which are free for only 10 mm (those of *A. steudneri* are 40–45 mm long with segments free almost to the base) and much smaller bracts.

The flowers of the new species are exceptionally fleshy and markedly triangular in cross-section. It should perhaps be mentioned that the flowers, possibly due to their fleshiness, appear to shrink considerably when dried (those recorded by Reynolds as 35 mm long, measure only ± 28 mm in the dried material, similar shrinkage was observed in material prepared by the author).



FIGS. 6 and 7.

Cultivated clone of *Reynolds* 11618 flowering at Nelspruit, height 60 cm.

Flowers 1/1, from bud to post pollination stage.

Aloe trigonantha Leach.

Photos L. C. Leach.

A. trigonantha appears to be morphologically so close to *A. crassipes* and also, although to a somewhat lesser extent, to *A. christianii* and *A. pretoriensis* Pole Evans that it seems logical that it should be included in Reynolds's Group 12 (Reynolds, Aloes Trop. Afr. & Madag. 1966). Its inclusion here does however, require some slight modification to the diagnosis of that Group, inasmuch as the leaves of the new species are obscurely white spotted and its perianth averages 35 mm in length. Subject to these adjustments *A. trigonantha* would then "key out" under:—

GROUP 12

A small to medium sized plants with a branched *inflorescence* up to 1 m high; *pedicels* 14—15 mm long.

- (1) *Plants* solitary; *leaves* unspotted; *inflorescence* 50—60 cm high; *bracts* 10 mm long; *perianth* 38 mm long, dull yellowish green . . . *A. crassipes*
- (1a) *Plants* forming groups from basal shoots: *leaves* obscurely white-spotted; *inflorescence* 60—90 cm high; *bracts* 5—10 mm long with a prominent median nerve; *perianth* 35 mm long, scarlet . . . *A. trigonantha*

Plants acaulescent, forming dense groups from basal shoots. *Leaves* about 24, densely rosulate, widely spreading, slightly recurved or somewhat flaccid towards the apex, usually with the apical portion dry and withered, 30—45 cm long, 5—10 cm broad at the base; *upper surface* pale green with a few elongated whitish markings, becoming pinkish brown towards the apex, sometimes with a purplish tinge towards the margins, shallowly concave low down becoming somewhat canaliculate above; *lower surface* rounded, pale blueish green, more copiously white-spotted than the upper; *margins* narrow, pinkish brown, cartilaginous, armed with deltate or sometimes uncinat teeth $\pm$ 3 mm long, 1—2 cm apart low down, more widely spaced above, with the interspaces straight or occasionally slightly curved. *Inflorescence* a branched panicle, branched well below the middle, 60—90 cm high with $\pm$ 3 main branches each bearing up to 4 secondary branches, all with a pair of broad scarious whitish bracts at their base. *Peduncle* plano-convex below, up to 2 cm wide towards the base, green with a very faint bloom (peduncle and branches brown when dry). *Racemes* rather laxly flowered, cylindric-acuminate, $\pm$ 20 cm long, 7 cm diam., with the buds spreading and the open flowers cernuous. *Bracts* deltate-attenuate to ovate-acuminate, scarious, brownish white, somewhat plicate-keeled, the smaller with a solitary prominent dark brown median nerve, the larger often with 1 or 2 additional less distinct shorter nerves on either side, 5—10 mm long, 3—5 mm wide, with minutely denticulate margins. *Pedicels* the colour of the perianth, sparingly minutely white flecked, the lowest up to

15 mm long. *Perianth* bright scarlet-red (RHS 39A) to orange scarlet, brownish orange inside the mouth, exceptionally thick and fleshy, with copious clear nectar, very shortly stipitate, articulated to the pedicel, averaging 35 mm long, 10–12 mm diam. at the rather truncate base, thence becoming markedly trigonous, gradually narrowing to 7–8 mm diam., slightly laterally compressed with the triangular opening at the mouth only 3–4 mm across; *outer segments* free $\pm$ 10 mm, with 3 somewhat obscure, darker coloured nerves becoming brownish at their confluent apex, with somewhat translucent paler margins, with the acute apices minutely denticulate, those of the lateral segments very slightly spreading then becoming sharply incurved and that of the lowest strongly recurved; *inner segments* themselves free but dorsally adnate to the outer, broader and somewhat less acute, pale yellowish with a raised reddish keel with 3 indistinct nerves confluent towards the minutely denticulate, orange-brown (orange-yellow inside), strongly spreading to recurved apex. *Filaments* filiform-flattened, lemon-yellow, the 3 inner narrower and lengthening before the 3 outer; *anthers* orange-brown, not or only slightly exerted. *Ovary* bright green, 6-grooved, narrowly ovoid-cylindric, 6.5 mm long, $\pm$ 3 mm diam. at the base, $\pm$ 2.5 mm diam. at the apex; *style* lemon-yellow, scarcely or up to 1 mm at length exerted; *stigma* white. *Seeds* dark to blackish brown, irregularly and variably triquetrous with thin wings, 5.5–7 mm long, $\pm$ 3 mm broad.

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